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Note on Damoiseau's "Tables Ecliptiques des Satellites de Jupiter."

By A. M. W. Downing, M.A.

An examination of the fundamental numbers for the formation of the arguments of the inequalities, given by Damoiseau, pp. iii–viii of the Introduction to his Tables, has recently been made here, for the purpose of verifying (and, if necessary, carrying on) Adams' corrections to Damoiseau's values of the arguments, given on p. 17 of the Appendix to the *Nautical Almanac*, 1881. As it appears more convenient to have the corrected numbers than to apply corrections to the arguments formed from the erroneous numbers, it may be worth while putting on record the result of the examination of Damoiseau's work. It should be noted that the object of the corrections tabulated below is to make the arguments consistent with the data given at the top of p. iii of the Introduction.

FIRST SATELLITE.

Argument.	*For.*			*Read.*		
	s	°	°	s	°	°
$u_{\rm i}-u_{\rm ii}$			$+i$ 180·7279427			$+i$ 180·7279424
$u_{\rm i}-\pi_{\rm iii}$	1	18·9465	$+i$ 0·1344456	1	18·9459	$+i$ 0·1344372
$u_{\rm i}-\pi_{\rm iv}$			$+i$ 0·1436792			$+i$ 0·1436793
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iii}$			$+i$ 1·3214486			$+i$ 1·3214475
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iv}$			$+i$ 1·3122065			$+i$ 1·3122054

SECOND SATELLITE.

Argument.	*For.*			*Read.*		
	s	°	°	s	°	°
$U-\pi'$			$+i$ 3·5029156			$+i$ 3·5029157
$U-u_{o}$			$+i$ 3·2076333			$+i$ 3·2076334
$u_{\rm ii}-u_{\rm iii}$	11	27·7519	$+i$ 181·4617960	10	27·7519	$+i$ 181·4617964
$u_{\rm ii}-\pi_{\rm iii}$			$+i$ 0·2699661			$+i$ 0·2699663
$u_{\rm ii}-\pi_{\rm iv}$			$+i$ 0·2885252			$+i$ 0·2885256
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iii}$			$+i$ 2·6536288			$+i$ 2·6536267
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iv}$			$+i$ 2·6350694			$+i$ 2·6350674
$u_{\rm ii}-\Pi$			$+i$ 0·2953146			$+i$ 0·2953149
$u_{\rm ii}-\Lambda_{\rm ii}$	8	21·8069	$+i$ 0·4128461	8	21·8269	$+i$ 0·4128463
$u_{\rm ii}-\Lambda_{\rm iii}$			$+i$ 0·3201667			$+i$ 0·3201668
$u_{\rm ii}-\Lambda_{\rm iv}$			$+i$ 0·3020441			$+i$ 0·3020443

THIRD SATELLITE.

Argument.	*For.*			*Read.*		
	s	°	°	s	°	°
$u_{\rm ii}-u_{\rm iii}$			$+i$ 5·8950578			$+i$ 5·8950600
$u_{\rm iii}-\pi_{\rm iii}$	1	19·3500	$+i$ 0·5443534	1	19·3502	$+i$ 0·5443535
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iii}$			$+i$ 5·3507118			$+i$ 5·3507070
$u_{\rm i}-2u_{\rm ii}+\pi_{\rm iv}$			$+i$ 5·3132886			$+i$ 5·3132845
$u_{\rm iii}-\Pi$			$+i$ 0·5954489			$+i$ 0·5954659
$u_{\rm iii}-\Lambda_{\rm iii}$	6	10·9058		6	10·9050	
$u_{\rm iii}-\Lambda_{\rm ii}$			$+i$ 0·8324332			$+i$ 0·8324532

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FOURTH SATELLITE.

Argument.	*For.*			*Read.*		
	s	°	°	s	°	°
$U-\pi'$	0	3·4178 + i	16·5123047	0	3·4181 + i	16·5123037
$U-u_0$	9	6·1550 + i	15·1203809	9	8·1553 + i	15·1203800
$u_{iii}-u_{iv}$	2	24·9629 + i	121·6066164	2	24·9726 + i	121·6066143
$u_{ii}-u_{iv}$	3	16·2853 + i	256·9946780	3	16·3121 + i	256·9946770
$u_{iv}-\pi_{iv}$	6	3·4433 + i	1·3600749	6	3·4506 + i	1·3600734
$u_{iv}-\pi_{iii}$	1	18·9271 + i	1·2726106	1	18·9343 + i	1·2725873
$u_{iv}-\Pi$	1	20·5205 + i	1·3921007	1	20·5277 + i	1·3920776
$u_{iv}-\Lambda_{iv}$		+ i	1·4238223		+ i	1·4237991
$u_{iv}-\Lambda_{iii}$	6	10·4045 + i	1·5092494	6	10·4118 + i	1·5092261
$u_{iv}-\Lambda_{ii}$	8	21·9415 + i	1·9461073	8	21·9488 + i	1·9461056

The greater number of these corrections are included in Adams' list mentioned above, and have therefore been applied in forming the times of eclipses given in the *Nautical Almanac* since 1881.

I suppose it is generally known that both the coefficient and argument of the inequality depending on the Great Inequality of *Jupiter* and *Saturn* (included in Damoiseau's Table III for the Second, Third, and Fourth Satellites) are erroneous. According to Souillart, the value of the argument is $5\bar{u}-2u_0-16^\circ 633$; and the coefficients are $0^s{\cdot}711$, $2^s{\cdot}110$, and $11^s{\cdot}644$ for the Second, Third, and Fourth Satellites respectively. In the continuation of Adams' Tables, used in the *Nautical Almanac* for 1891 and subsequent years, Adams appears to have adopted nearly identical expressions to those found by Souillart for these inequalities.

Nautical Almanac Office:
1892 *June* 9.

Data for computing the Positions of the Satellites of Jupiter, 1892.

By A. Marth.

The following data for computing the positions of the satellites during the present apparition of *Jupiter* correspond to the data for the preceding apparition on pages 518–523 of Vol. 51 of the *Monthly Notices.* The motions of the longitude and of arguments and the inequalities corresponding to the arguments are to be found there on pages 524–539.

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